

SECTION 10426
TACTILE/BRAILLE SIGNAGE

PART 1 - GENERAL

0.1 DESCRIPTION OF WORK

- A. Work Included: This Section specifies all ADA-required Tactile/Braille signage as indicated on the Drawings and specified herein.
- B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
 1. Section 05500 - MISCELLANEOUS METALS
 2. Section 10100 - DISPLAY CASES
 3. Section 10400 - FIXED SIGNAGE
 4. Section 10401 - METAL SIGN FRAMES
 5. Division 16 - ELECTRICAL - "Exit" signs; and "Variable Message Signs".
- C. Permits: Obtain permits as required by Local Authorities for installation of signs.

0.2 SUBMITTALS

- A. Product Data: Manufacturer's product data, any limitations and recommendations for each material used, installation instructions, and manufacturer's certification (stating that materials comply with requirements) for the Designer of Record's and MBTA Capital Delivery Department's review and approval.
- B. Approval Drawings: Provide dimensioned shop drawings of each individual sign, based on .eps files supplied by the MBTA Capital Delivery Department, along with a complete sign schedule utilizing the same designations as indicated on the MBTA Capital Delivery Department's drawings. The shop drawings must represent exactly what will be etched on each sign. No fabrication shall take place without approval of the shop drawings by the Designer of Record and MBTA Capital Delivery Department.
- C. Provide four copies of shop drawings for action by the Designer of Record and MBTA Capital Delivery Department.
- D. Samples for Approval:
 1. Provide one full-size, complete sample of a representative sign, etched, painted and finished, for approval by the Designer of Record and MBTA Capital Delivery Department.

2. ADA compliance: Contractor shall complete the attached "ADA Tactile/Braille Metrics Check list" to assure that all metrics of sample sign are in compliance with ADA defined metrics.
3. Approval of sample sign is required from the Designer of Record and MBTA Capital Delivery Department prior to final signage production.
4. Sample will be resubmitted, if necessary, until it meets quality standards outlined in the next section.
5. Once approved, the sample sign will be forwarded to the project site for installation (completed sample sign to be provided to the Designer of Record and MBTA Capital Delivery Department at no extra charge).

0.3 QUALITY ASSURANCE

- A. Reference Standards: The work shall conform to the codes and standards of the following regulatory Agencies and Authorities as further cited herein:
 1. ADA: Americans with Disabilities Act 2010 Standards
 2. ANSI: American National Standards Institute.
 3. ASTM: American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103 as published in "Compilation of ASTM Standards in Building Codes".
 4. MAAB: Massachusetts Architectural Access Board.
- B. Performance Requirements
 1. Painted Sign Finish shall comply with the following performance requirements:
 - a. Weatherability: When tested in accordance with ASTM G 53, after 500 hours in Weatherometer (equivalent to approximately 3 years exterior exposure):
 - b. Gloss retention not less than 88.0 determined in accordance with ASTM D 523 at a 60 degree angle.
 - c. Color shall not change more than 1.68 units determined in accordance with STM D 2244 and measured with a Hunter Colorimeter, Model D25.
 2. Durability: Sign finish shall not effect after repeated use of cleaners such as Graffiti Remover #1120 manufactured by Organics Corp., Lodi, NJ.
- C. Source: For each type of material required for the work of this section, provide Single-Source Responsibility.
- D. Accessibility: The ADA 2010 Standards and the MAAB regulations are pertinent to the design and installation of items covered under the work of this Section. When guidelines conflict, the guideline giving greater access shall be applicable.

- E. Qualifications: The approved manufacturer shall have a minimum of 5 years of successful experience with similar work, and shall have a reputation for doing satisfactory work on time.
- F. Coordination: The work in this Section shall be completely coordinated with the work of other Sections. Verify dimensions and work of other trades that adjoin materials of this Section before the installation of items herein specified. Cooperate with such trades to assure the steady progress of all work under this Contract.
- G. Certification: Submit manufacturer's certification that materials furnished comply with requirements specified.
- H. Maintenance Instructions: Submit manufacturer's instructions for maintenance of tactile/braille sign to the MBTA, including precautions for use of cleaning materials and solvents.
- I. Warranty:
 - 1. Submit a written Manufacturer's warranty for MBTA acceptance, signed by the manufacturer, agreeing to repair or replace panels that fail during the specified warranty period. Failures include, but are not limited to, the following:
 - a. Coating degradation.
 - b. Chipping, chalking, fogging or discoloration.
 - c. Fading.
 - 2. Warranty Period: 1 year from product ship date.

0.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store work under this Section in a manner to prevent the cracking or stress of components, and to prevent mechanical damage or damage from the elements.
- B. Deliver work under this Section to Site in ample time to avoid delay in job progress and at such times as to permit proper coordination of the various parts.
- C. Installation of this work shall be scheduled to occur near time of Substantial Completion.
- D. Inspect sign components for damage on delivery.
 - 1. Do not install damaged signs. Replace any damaged signs with new signs.

0.5 PROJECT CONDITIONS

- A. Inspection of Site: The Contractor shall visit the site of the proposed work and become fully acquainted with existing conditions, and to become fully informed as to the facilities involved and the difficulties and restrictions

attending the performance of the Contract, prior to submitting a price quotation.

B. Substrates: Proceed with work of this Section only when substrate construction and penetration work have been completed.

PART 2 - PRODUCTS

0.1 SUPPLIED GRAPHICS

A. The MBTA Capital Delivery Department will prepare and supply all digital sign graphics (physical size, layout and content) in .eps format for etching. All graphic files are vector graphics, no font replacement is necessary.

0.2 MATERIALS

A. Zinc Signs

1. 0.125" one-piece zinc plate, utilizing chemical etch process to produce raised characters in compliance with ADA and supplied graphics. Chamfer or ease all sides and corners to remove sharp edges.
2. Acceptable Manufacturers: the following is a partial list of zinc signage manufacturers:
 - a. Vivid Manufacturing
 - b. Dixie Graphics
 - c. Kroy Sign Systems
 - d. Etchcraft Incorporated
 - e. Advance Corporation
 - f. ADA Signs
 - g. ASI
 - h. ASE Manufacturing

B. Attachments

1. Mechanical:
 - a. Threaded inserts appropriate to substrate material - 4 per sign
 - b. Tamper resistant, $\frac{1}{4}$ " diameter stainless steel Flat Head Phillips Pin-Head screws. Screws shall seat into countersunk holes such that when fully tightened the screw head is flush with sign background surface. Paint screws to match background paint color of sign
 - c. Non-metallic Washers: Provide rigid neoprene separators between fasteners and non-compatible materials being joined.
2. Adhesive:
 - a. Where adhesive mounting techniques are specified, very high bond (VHB) tape specifically designed for compatibility with the base materials and the desired adhesive strength shall be used. All adhesives shall be tested on site. All adhesives shall be indicated in the shop drawings.

- b. Very high bond (VHB) tape shall be double coated acrylic foam tape as manufactured by the 3M Co., or approved equal.
- c. Surfaces on which signage is to be installed using adhesive shall be free of grease, oil, or any other residue.

0.3 Fabrication

- A. Zinc Signs:
 - 1. Etching: Signs reverse-etched to create all tactile text, lines, arrows, and braille glyphs raised 1/32" high. Braille glyphs shall be standard rounded grade 2 Braille as rendered in the EPS files. Cross section angle of raised characters shall not exceed 45 degrees. Text and Braille shall be finished to provide smooth, non-pointed edges. Background surface shall be smooth texture.
 - 2. Finishes:
 - a. Background - Mathews baked-on acrylic polyurethane enamel paint with eggshell/matte finish. Custom color shall be: Black.
 - b. Foreground - (Tactile lettering only) brushed natural zinc with U.V. resistant clear urethane topcoat.
 - c. Predrilled holes: Provide four 1/4" counter sunk mounting holes, centered 3/8" from edges, only in corners of signs scheduled to be screw attached. All other signs to be provided without mounting holes.

PART 3 - EXECUTION

0.1 INSPECTION

- A. Prior to installation, the Installer shall examine substrates, supports, and conditions under which this work is to be performed, and notify the Contractor and the Designer of Record in writing of conditions detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected. Beginning work means Installer accepts substrates and conditions.
- B. Notification Point: Designer of Record and MBTA Capital Delivery Department will be given 72 hour notice to perform field inspection prior to the start of signage installation. The MBTA Capital Delivery Department shall conduct a detailed inspection of all tactile/braille signs to be installed prior to installation to assure compliance with the supplied drawings. A formal signoff by the MBTA Capital Delivery Department must be executed prior to commencement of any installation. If work does not meet project requirements, contractor must replace deficient work.

0.2 INSTALLATION/APPLICATION/ERCTION

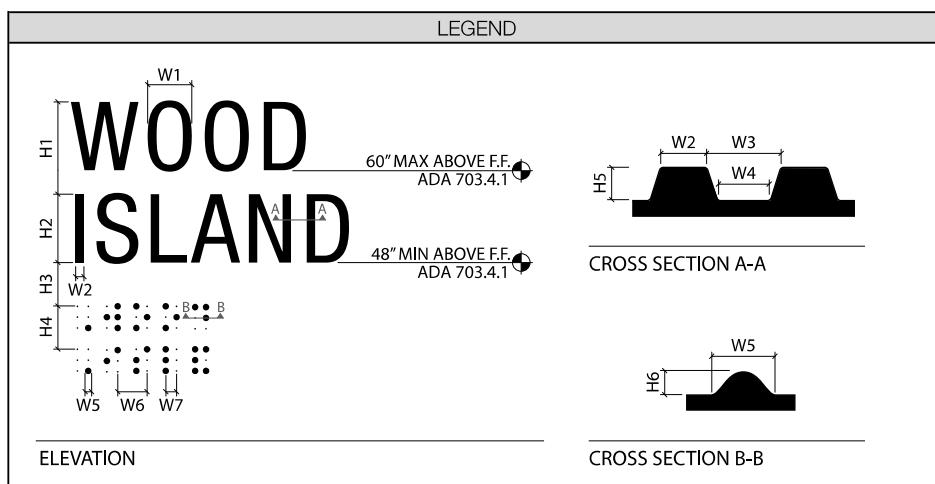
- A. All locations where signs are to be installed new or retrofitted to existing frames must be field measured by contractor. This must be documented and sent to the Designer of Record and MBTA Capital Delivery Department prior to final digital artwork submittal and fabrication of signage.
- B. Strictly comply with approved shop drawings and manufacturer's instructions and recommendations, except where more restrictive requirements are specified in this Section.
- C. Install work plumb, level, and in true plane and alignment. Provide signs and graphics where shown or scheduled using mounting methods indicated.
- D. Protect adjacent or adjoining surfaces and work from damage during installation in this Section.
- E. Work shall be designed and anchored so that work will not be distorted nor the fasteners overstressed from expansion and contraction of metal or other materials as applicable.
- F. The Tactile/Braille signs are small in size and shall be installed plumb and square. In the event that an adjacent material, such as a doorframe, is slightly out of plumb, the contractor shall install the Tactile/Braille sign parallel so as to minimize the visual conflict.

0.3 CLEANING AND PROTECTION

- A. Adjust work to present the best possible appearance. Touch-up damaged finishes and eliminate any evidence of repair. Clean exposed surfaces using materials and methods recommended by manufacturer of material or product being cleaned. Remove and replace work that cannot be successfully repaired or cleaned.
- B. Provide temporary protection to ensure work is delivered without damage or deterioration at time of final acceptance. Remove protections and reclean as necessary immediately before final acceptance.
- C. Manufacturer shall provide Authority with information on cleaning and maintenance recommendations for all signs.
- D. Names, stamps and decals of manufacturers, installers or maintainers of signs shall not be visible in the finished work.

0.4 ADA Compliance Checklist

- A. Tactile/Braille signs must comply with the dimensional requirements of ADA 703.3 (2010). The following legend graphically illustrates each ADA 703.3 metric.
- B. Once a mockup has been fabricated, and prior to submission for approval, the fabricator must complete the following check list to assure that the sample product is in complete compliance with ADA metrics. Completed checklist must be submitted with sample sign for approval. Samples submitted without a completed checklist will be rejected.
- C. Tactile metrics legend



D. ADA 703.2 and 703.3 Compliance Checklist

ADA 703.2 – Raised Characters						
Legend Symbol	ADA Reference	Description	ADA Values	ADA Values for 5/8" Text	Check by Contractor	Check by Designer
H5	703.2.1 Depth	Depth of character above background	$\geq 1/32"$ (0.8 mm)	-		
-	703.2.2 Case	All Uppercase	Y/N	-		
-	703.2.3 Style	Sans serif, not italic, oblique, script, highly decorative, or of unusual forms	Y/N	-		
W1	703.2.4 Character Proportions	Width of uppercase "O" relative to height of uppercase "I" (H2)	$0.55 \leq W1/H2 \leq 1.1$	Min: 0.344" Max: 0.743"		
H2	703.2.5 Character Height	Height of uppercase "I"	$0.625" \leq H2 \leq 2"$ 16 mm $\leq H2 \leq 51$ mm	0.625"		
W2	703.2.6 Stroke Thickness	Width of uppercase "I" relative to height of uppercase "I" (H2)	$W2/H2 \leq 0.15$	$\leq 0.094"$		
W3	703.2.7 Character Spacing	Rectangular cross section or top of beveled cross section	$0.125" \leq W3 \leq 4(W2)$ 3.2 mm $\leq W3 \leq 4(W2)$	Min: 0.125" Max: 0.376"		
W4	703.2.7 Character Spacing	Base of beveled cross section	$0.0625" \leq W4 \leq 4(W2)$ 1.6 mm $\leq W4 \leq 4(W2)$	Min: 0.063" Max: 0.376"		
H1	703.2.8 Line Spacing	Distance between baselines of raised characters relative to height of uppercase "I" (H2)	$1.35 \leq H1/H2 \leq 1.7$	Min: 0.844" Max: 1.063"		

ADA 703.3 – Braille						
Legend Symbol	ADA Reference	Description	ADA Values	-	Check by Contractor	Check by Designer
-	703.3.1 Dimensions & Capitalization	Domed or rounded shape	Y/N			
-	703.3.1 Dimensions & Capitalization	Uppercase letters only before first word of sentences, proper nouns and names, individual letters of the alphabet, initials, acronyms	Y/N			
W5	703.3.1 Braille Dimensions	Dot base diameter	Min: 0.059" (1.5 mm) Max: 0.063" (1.6 mm)			
W7	703.3.1 Braille Dimensions	Distance between two dots in the same cell	Min: 0.090" (2.3 mm) Max: 0.100" (2.5 mm)			
W6	703.3.1 Braille Dimensions	Distance between corresponding dots in adjacent cells	Min: 0.241" (6.1 mm) Max: 0.300" (7.6 mm)			
H6	703.3.1 Braille Dimensions	Dot Height	Min: 0.025" (0.6 mm) Max: 0.037" (0.9 mm)			
H4	703.3.1 Braille Dimensions	Distance between corresponding dots from one cell directly below	Min: 0.395" (10 mm) Max: 0.400" (10.2 mm)			
-	703.3.2 Position	Braille below corresponding text. If multi-lined, below entire text.	Y/N			
H3	703.3.2 Position	Distance from Braille to tactile characters, raised borders, and decorative elements.	$\geq 0.375"$ (9.5 mm)			

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Tactile/braille signage will be measured as per each complete in place, including all preparation, accessories and incidentals.

4.2 PAYMENT

- A. Payment for tactile/braille signage will be made at the Contract unit price for the quantities as specified above.

4.3 PAYMENT ITEMS

ITEM NO.	DESCRIPTION	UNIT
1042.019	TACTILE/BRAILLE SIGNS	EA

END OF SECTION